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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/068,727	02/06/2002	Jorg-Achim Fischer	HK-645	8722

7590 02/25/2004

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HOLLYWOOD, FL 33022-2480

EXAMINER

PHAM, HAI CHI

ART UNIT	PAPER NUMBER
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2861

DATE MAILED: 02/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/068,727

Applicant(s)

FISCHER ET AL.

Examiner

Hai C Pham

Art Unit

2861

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 November 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-8, 10-17 and 19-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8, 11-16, 19, 20 and 22-24 is/are rejected.
- 7) ☒ Claim(s) 10, 17 and 21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 11/24/03.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Allowable Subject Matter

1. The indicated allowability of claims 13 and 23 is withdrawn in view of the newly discovered reference to Roberts (U.S. 5,748,222). Rejections based on the newly cited reference follow.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-4, 14, 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicants' Acknowledged Prior Art (referred hereinafter as AAPA) in view of Wilson (U.S. 4,995,693) and Dewey et al. (U.S. 4,577,926).

AAPA discloses a conventional method and a multibeam scanning device for engraving by ablation of film, printing plate or flexo printing plate supported on a rotating drum having an axis, the method comprising locating a number of laser fiber exits beside one another with an optical switch array having number of optical switches corresponding to the number of laser fiber exits, simultaneously emitting a plurality of laser beams, which emerge from the laser fiber exits, modulating the laser beams independently of one another by using the optical switch array, imaging the modulated laser beams as a multi-

spot array on the surface of the material on the drum with an optical system, and laser engraving the surface with the mufti-spot array by moving the laser fiber exits, the optical switch array, and the optical system together in an axial direction of the drum while scanning the surface with the mufti-spot array in a circumferential direction of the drum (see "Field of the Invention" section of the Specification).

However, AAPA does not explicitly disclose the optical switches being acousto-optic modulators, and the laser fibers exits being arranged in a fan shape for intersecting the partial beams in a vicinity of the entry pupil of the optical system.

Regardless, it is well known in the art that typical optical switches used as modulators for modulating incident laser beams can be selected from a variety of modulation devices such as optical shutters, acousto-optic modulators or acousto-optic deflectors. Wilson discloses a multi-position opto-electronic switch including an array of acousto-optic switches (AOMs 46) for selectively coupling the output light beams (42) exited from the corresponding ends of a plurality of optical fibers (40) for modulating and deflecting the modulated light beams (60) toward the scan lens (62) to form an image line (66) at the surface to be scanned (Fig. 2), each of the acousto-optic switches dividing up the incident laser beam into two partial beams (zero order output beam 30 and first order output beam 28, Fig. 1) each modulated independently of one another. Therefore, because the optical switch modulators and the acousto-optic modulators were art-recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to substitute the optical switch modulators of AAPA for acousto-optic modulators as taught by Wilson.

On the other hand, Dewey et al. discloses a fiber optic writing head including a plurality of optical fibers whose exit ends are arranged in a fan shape along the surface (30) such that the laser beams are directed at the center (42) of the entrance pupil of the writing lens to produce an image uniform in focus and intensity at the scanned surface (22). Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to position the exit ends of the optical fiber array of AAPA in a fan shape as taught by Dewey et al. The motivation for doing so would have been to allow the converging illumination of the modulated beams be fully collected by the scanning lenses.

4. Claims 5 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Wilson and Dewey et al., as applied to claims 1 and 14 above, and further in view of Ferguson et al. (U.S. 5,780,806).

AAPA in view of Wilson and Dewey et al. discloses all the basic limitations of the claimed invention except for the laser fiber exits being YAG laser fiber exits.

Ferguson et al. discloses a laser ablation system comprising a laser head provided with a Nd:YAG laser operating at a wavelength and a power that can be transmitted through optical fibers without causing a breakdown of the optical fibers and having a high repetition rate, acousto-optic Q-switched, for providing efficient laser light ablation of the material.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate a laser fiber YAG as taught by Ferguson et al. in the

modified device of AAPA. The motivation for doing so would have been to provide a highly efficient laser beam delivery system for ablating the printing plate.

5. Claims 6-8 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Wilson and Dewey et al., as applied to claims 1 and 14 above, and further in view of Latta (U.S. 4,295,145).

AAPA in view of Wilson and Dewey et al. discloses all the basic limitations of the claimed invention except for the application of voltage signals with at least two different frequencies to each AOM, and the partly overlapped beam spots on the drum.

Latta discloses a high speed laser scanning system including an acousto-optical modulator driven at two or more carrier frequencies for scanning with a plurality of focused beams simultaneously, wherein the carrier frequencies are selected such that the laser beam spots are overlapped within a small tolerated overlap area.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to incorporate the multi-frequency acousto-optic modulator as taught by Latta in AAPA's modified device. The motivation for doing so would have been to reduce the scan rate required of the deflection apparatus as suggested by Latta at col. 1, lines 30-39.

6. Claims 11-13, 19, 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA in view of Wilson and Dewey et al., as applied to claims 1 and 14 above, and further in view of Roberts (U.S. 5,748,222).

AAPA in view of Wilson and Dewey et al. discloses all the basic limitations of the claimed invention except for telecentrically imaging the laser fiber on the surface of the optical system (claims 11, 22), aligning the partial beams in parallel downstream of the optical system (claims 12, 19), and widening the diameter of the partial beams while reducing the angular spacing of the partial beams (claims 13, 23).

Roberts discloses a laser engraving head using acousto-optic modulator, which deflects the laser beam toward a telecentrically arranged lens (L) for focusing the modulated laser beams on the medium (drum 2) such that the focused laser beams are aligned in parallel downstream of the lens (L) (see Fig. 6), the laser engraving head further including beam expanders (20) to provide a complete control of the spot size by optimizing the spot size while minimizing the land separating the engraved spots (see col. 7, lines 1-23).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify AAPA device with the aforementioned teachings of Roberts for the purpose of providing a complete control of the spot size as suggested by Roberts.

Allowable Subject Matter

7. Claims 10, 17 and 21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

8. Applicant's arguments with respect to claims 1-8, 11-16, and 22-24 have been considered but are moot in view of the new grounds of rejection presented in this Office action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hai C Pham whose telephone number is (703) 308-1281. The examiner can normally be reached on T-F (8:30-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (703) 308-4896. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



HAI PHAM
PRIMARY EXAMINER

January 29, 2004